Dialog, *16*(1), 1-19
Copyright © 2013,
ISSN: 1930-9325

RESEARCH ARTICLE

Prediction of Early Engagement and Completion of a Home Visitation Parenting Intervention for Preventing Child Maltreatment

Jennifer B. Lefever
University of Notre Dame

Kathryn M. Bigelow
University of Kansas

Judith J. Carta
University of Kansas

John G. Borkowski
University of Notre Dame

Objective: We examined predictors of engagement and completion in a randomized trial comparing the effectiveness of two interventions for preventing child maltreatment and promoting positive parenting. Methods: Participants in this study were 255 mother-child dyads, most of whom were enrolled in Head Start programs, were randomly assigned to a 5-session home visitation intervention (Planned Activities Training-PAT) or to a similar parenting intervention enhanced by the addition of cell phone calls and text messages (CPAT). Results: (1) Early engagement and participation in the cellular phone enhanced program predicted intervention completion, and (2) the quality of parenting prior to entrance in the program predicted engagement. Conclusions: The results have important implications for engagement and completion in home visitation programs aimed at promoting positive parenting among high- risk mothers. Implications for practitioners are also discussed.

A growing number of home visiting parenting programs have shown positive results in reducing child maltreatment and enhancing parenting skills in high-risk populations. Yet, meta- analyses of home visiting programs have not reported consistently positive outcomes for parents and children (Astuto & Allen, 2009; Layzer, Goodson, Bernstein, & Price, 2001; Sweet & Appelbaum, 2004). One barrier to achieving improved outcomes is less than optimum levels of parent participation in the programs, or the high rates of attrition and failure to complete these intervention programs before families reach a specified level of parenting competence (McCurdy

& Daro, 2001). When families miss home visit appointments or drop out of interventions early, even the most powerful interventions will have diminished effects. However, reviews of home visiting programs report rates of dropping out as high as 80% in some programs, with many families who do stay in programs receiving less than half of the intended number of visits or dosage of the intervention (Gomby, 2000).

A second barrier to home visiting effectiveness is parent engagement—the extent to which parents carry out the behavioral or affective components of the intervention program such as keeping up with learning activities between visits and seeking more information (Berlin, O'Neal, & Brooks-Gunn, 1998; Korfmacher et al, 2008). Programs that are able to maintain parents' participation and keep them involved and actively engaged are thus more likely to achieve the desired results of improved parenting outcomes (Gomby, 2005). However, when families become disengaged from a parenting intervention (that is, when they only passively attend to activities and discussion during the home visit or when they fail to follow through on recommended parenting strategies or homework in between intervention sessions), this will result in less than complete dosage of the intervention and will likely influence parenting outcomes (Sweet et al., 2004).

Thus, enhancing families' engagement in parenting programs and striving to maintain families in these programs until they complete the course of intervention have become important goals for service providers that seek to reduce and prevent child maltreatment and harsh parenting. Yet, research has not shed much light on the variables that influence parents' engagement in home visiting programs. Moreover, scant research has been conducted on interventions to influence parents' engagement in home visiting programs.

ENGAGEMENT AS A FOCUS OF RESEARCH

Defining parent engagement. Critical to understanding the relationship of parent engagement in an intervention to various child and parenting outcomes is acknowledging that the term "engagement" is used interchangeably in the literature with several other terms such as attendance, participation, involvement, adherence, and compliance; and these terms are defined differently across studies. Some researchers define engagement as showing up for home visits or appointments or staying in treatment (Littell, Alexander, & Reynolds, 2001; Wagner et al., 2003). Others refer to engagement as the level of involvement in intervention activities. For example, Cunningham and Henggeler (1999) refer to emotional involvement in sessions, and completing homework. Similarly, Yatchmenoff (2005) made a distinction between engagement and compliance stating that engagement is "positive involvement in a helping process" whereas compliance involves "going through the motions" of an intervention's protocol. A definition of parent engagement offered by Prinz and Miller (1991) acknowledges this more active dimension of engagement by describing it as "participation necessary to obtain optimal benefits from an intervention" (p. 382) that includes regular attendance, involvement and cooperation during intervention sessions, and effort that goes beyond the sessions.

Recognizing that engagement is a dynamic variable that changes over time, many researchers point to the critical importance of the earliest stages of parents' involvement in an intervention because parents are likely to drop out if they see no hope of the benefits of the treatment (Coatsworth, Santisbean, McBride, & Szapocnik, 2001: Liddle, 1995). Thus, in this study, we incorporated these multiple elements into our conceptualization of engagement and

defined it as "the extent that parents participated in each intervention session, practiced and demonstrated mastery of parenting skills targeted during the intervention session, and the degree of independence they had in carrying out those activities".

Predictors of parent engagement and completion. Researchers have carried out a number of studies to identify factors that help predict families' engagement and completion of preventive parenting interventions (Gorman-Smith, Tolan, Henry, Leventhal, Schoeny, & Lutovsky, 2002; Prado, Pantin, Schwartz, Lupei, & Szapocnik, 2005). Research on family risk factors related to engagement and completion have been mixed. Some studies have indicated that families with greater levels of risk are more likely to stay involved in programs (Ammerman et al., 2006). For example, Duggan and colleagues (1999) reported that families with mothers or fathers involved in substance abuse were likely to stay in home visiting programs more than a year longer than other families. Similarly, Girvin et al. (2007) reported that parents with higher levels of depression were more likely to complete programs. However, just as many studies report that families with more risk factors and with fewer advantages such as higher education and higher income tend to drop out of programs sooner or become disengaged (Wagner et al., 2003). Several studies have identified low socioeconomic status, single-parent status, ethnic minority status, parental depression, and living with a low-income as predictors of disengagement or lower quality participation in parenting programs (Fontana et al., 1996; Kazdin, Holland, & Crowley, 1997; Nix, Bierman, & McMahon, 2009). Other risk factors associated with lower rates of involvement or engagement have included parents who were substance abusing (Navai-Waliser et al., 2000) or mothers who experienced high levels of family conflict (Herzog, Cherniss, & Menzel, 1986). One factor that may complicate this literature is that preventative parenting programs are quite different in their content, their duration, and the age of children who are the focus [e.g., parents of newborns or infants (Armstrong, Fraser, Dadds, & Morris, 1999); preschoolers (Baker, Piotrowski, & Brooks-Gunn, 1999); or adolescents (Dishion & Kavanaugh, 2000)]. Similar patterns of predictors of engagement may not be operating across these different programs with parents having different motivations for becoming involved, and family members having differing perceptions about whether the time commitment needed is worthwhile (Korfmacher et al., 2008).

A smaller set of studies have focused on variables that contribute to parents' early engagement in a program—in other words, examining the factors that help to draw them into parenting programs initially or alternatively, what drives parents away from parenting prevention programs when they are first enrolled (Ammerman et al, 2006). Kitzman et al (1997) determined that mothers who were likely to get engaged in home visiting interventions early on were those who were more motivated, who were interested in service, or who had the time management skills needed to keep scheduled appointments. Alternatively, factors that have been found to inhibit families from early involvement include frequent family crises (St. Pierre & Layzer, 1999); competing responsibilities such as needing to spend long hours in work or school (Gomby et al., 1999; Roggman et al, 2002); or family members who refuse to allow home visitors into the home (Daro & Harding, 1999). In this study we were interested in examining factors that predicted engagement, and specifically, those that predicted higher levels of engagement at the outset of the program, as well as those that predicted mothers completing the parenting intervention.

Interventions aimed at improving parent engagement. In the field of child mental health, a range of intervention studies have been carried out with the specific aim of improving parent engagement and retention. Researchers have studied a variety of interventions some of which were simple, such as providing appointment reminders (Watt et al. 2007) or using monetary incentives to promote retention (Heinrichs, Bertram, Kuschel, & Hahlweg, 2005), to much more complex and intensive interventions designed to identify and address families' sources of resistance to treatment such as Motivational Interviewing (Miller & Rollnick, 2002). Another type of intervention that has been tested is making structural adaptations or additions to the intervention. For example, Cunningham, Bremner and Boyle (1995) tested whether delivering parent training in a group format would improve parents' participation over individual clinic- based sessions.

A recently used innovation for promoting engagement in a variety of health promotion interventions is using cellular phones to increase contact with patients, provide reminders of patient behaviors in the health protocol, and to send messages of encouragement for maintaining involvement. For example, researchers have recently tested the effectiveness of using cellular phones to increase HIV-positive patients' adherence to antiretroviral medication therapies (Villanueva, 2007) and to maintain smokers' involvement in smoking cessation programs (Lazev, Vidrine, Arduino & Gritz; 2004). Both of these studies have documented that the increased contact afforded by cellular phones can help keep high risk participants engaged in public health interventions.

We recently examined the effectiveness of adding cellular phones and texting to an intervention aimed at promoting the parenting skills of parents at risk for child maltreatment. Through a randomized trial, we compared the efficacy of two parenting interventions: one was a home-based parenting intervention and the second was the same intervention with cell phone enhancements. The first intervention, Planned Activity Training (PAT), taught parents a set of parent-child interaction skills using behavioral methods of role playing, modeling, coaching, and specific feedback (Lutzker & Bigelow, 2002). In PAT, the parent learns to plan stimulating play and daily living activities in advance, prepare the child for these activities, and engage the child in activities using effective positive interaction skills and incidental teaching. The focus of PAT is preventing challenging behaviors or situations by considering their antecedents. Parents are taught to attend to and reinforce appropriate, desired behavior, and ignore minor misbehavior. The PAT model is typically carried out in the family home and involves five to seven training sessions that last approximately 2 hours each. The second intervention, Cellular Phone-Enhanced PAT (CPAT), was an adaptation of the PAT intervention. In CPAT, in addition to the in-home parenting intervention, parents were provided with a cell phone during the intervention phase of PAT. Cellular phones were used to promote more frequent contact between the family coaches and the families and, thus, increase the dosage of intervention families receive through (1) phone calls that occurred between home visits and (2) twice-daily text messages.

The purpose of the current study was to examine factors related to engagement and completion of high-risk families who participated in the efficacy trial of PAT and CPAT interventions. Specifically, we sought to extend the literature on engagement and completion in parent training programs by examining how early levels of engagement in a home visiting intervention predicted families' completion of the intervention. We also sought to examine how families' baseline characteristics such as the entering level of socio-demographic risk, child behavior and parenting skills predicted their initial level of engagement. Finally, we were interested in examining whether families' assignment to PAT or CPAT conditions would

influence their engagement and completion in the intervention. We predicted that parents who were most engaged in the intervention early on would be most likely to complete the intervention. We thought that the families at highest risk would be the most challenging to engage and to stay involved and complete the intervention. Finally, we expected that parents in the CPAT group would be more likely to maintain engagement and complete the intervention than parents in the PAT group because those in the CPAT group had greater opportunities to communicate with their home visitor and receive more timely information during the course of intervention.

We defined maternal engagement in the intervention session in terms of participation, ease of keeping the mother's attention, maternal focus on practicing new skills, and competence in acquiring parenting skills. Baseline, or pre-intervention measures, included the quality of parenting skills, cooperative child behavior and family socio-demographic risks. This study had 3 primary aims: (1) to describe engagement in the parenting intervention; (2) to assess whether early engagement influenced program completion and determine whether the use of cellular phones affected completion rates; and (3) to relate pre-existing child behavior and maternal characteristics, such as current parenting practices and level of socio-demographic risk, to the level of early engagement in the intervention.

METHOD

Participants

The sample used for the current study consisted of 255 mother-child dyads who were enrolled in the intervention conditions of a randomized clinical trial comparing the efficacy of two parenting interventions, Planned Activities Training (PAT), and CPAT--a cellular phone enhanced parenting intervention (Carta, Lefever, Bigelow, Borkowski, & Warren, 2011). Mothers were recruited from community health, early education and social service agencies that served low-income families in South Bend, Indiana and inner-urban Kansas City, Kansas and Missouri. Eligibility criteria for mothers included being either younger than 18 years at the birth of their first child, having less than a high school diploma or equivalent, or meeting the income guidelines for Head Start. A total of 36 mothers completed the enrollment visit but did not begin the intervention. All analyses were completed using data from the remaining 219 mothers who actually began the intervention and had intervention engagement data available. Of the 219 participants, 120 mothers (55%) were randomly assigned to the traditional intervention group (PAT) and 99 (45%) mothers were assigned to the cell phone enhanced condition (CPAT).

Mean maternal age for the analysis sample was 29.15 years (SD = 5.76); average annual estimated family income was $16,869 (SD = 11,810). Fifty-two percent of the mothers were Hispanic, 27% were African-American, non-Hispanic, 18% were white, non-Hispanic and 4% were either mixed race or Asian-American. Children's mean age at enrollment was 4.59 years (SD = .60); more than half were boys (57%). There were no significant differences between the mothers who did and did not begin the intervention in terms of demographic factors, risk index score, parenting skills or child behaviors - except for ethnicity; mothers who were African-American, non- Hispanic were less likely to begin the intervention after enrollment than mothers who were Hispanic (see Table 1). . There were no significant baseline differences between the intervention groups; demographic variables across groups are presented at the top of Table 1.

TABLE 1
Demographic Variables and Percentage of Parents with Each Risk Index Variable within Intervention Groups

Demographic Variables	CPAT	PAT
Mother's age	M = 27.47 years (SD = 5.69)	M = 28.88 years (SD = 5.82)
Child's age	M = 4.59 years (SD = .60)	M = 4.58 years (SD = .59)
Child gender	53.5% male	59.2% male
Income	M = $18,702 (SD = 19,339)	M = $17,307 (SD = 14.137)
Race	49% Hispanic, 26% Black, 22% White, 3% other	55% Hispanic, 28% Black, 14% White, 3% other
Risk Index Variables	**CPAT**	**PAT**
Mother was not working or in school	32.30%	35.80%
Mother did not have a high school diploma or GED	39.40%	33.11%
Mother was unmarried and without a partner	75.80%	82.40%
Mother received some form of financial assistance	55.60%	46.70%
Mother was a teenager at the time of her first birth	33.30%	40.80%
Mother was depressed (mild to severe depression on Beck Depression Inventory - II)	29.20%	31.30%
Average risk index score	M = 2.65 (SD = 1.10)	M = 2.68 (SD = 1.26)

Design and Procedure

The current study was a pretest-posttest randomized experimental design with two intervention conditions and a wait-list control group, with repeated measures of parent engagement and intervention fidelity in the intervention conditions. For the current study the focus was on intervention engagement; therefore a limited sample (intervention groups only) and portion of data available from the larger study was used. Intervention engagement, pre-test assessment data as well as post-test intervention satisfaction data were used in analysis and are described below. Upon consent and enrollment in the study, parents were randomly assigned to one of the two

treatment conditions and participated in a maternal interview of socio- demographic risk. Next, research assistants who were naive to intervention condition assignment conducted and rated a 20-minute direct observation of mother-child interaction during a baseline assessment in their home. Mothers were compensated $25 for their time in completing these measures.

Parents in both conditions then participated in the home-based parenting intervention (PAT), with 3 to 8 home visits conducted by family coaches. The intervention was considered complete when the parent met the mastery criterion on three different activities targeted during intervention. Because completion required meeting this criterion, some families required more sessions to complete the intervention than others. After each home visit, the family coaches completed a questionnaire rating the parent's level of engagement in the session. For parents assigned to the CPAT condition, parents received the PAT intervention but were also provided with a cellular phone with unlimited service during the course of the intervention. With the provided phone, they received text messages twice per day, five days per week and phone calls once per week.

Upon completion of the intervention, the naïve assessor returned to the home for a post-test visit which included a brief survey pertaining to satisfaction with the intervention. All participants' surveys were handed to them in a manila envelope. They were asked to complete the survey on their own and return it to the assessor in the sealed envelope. Mothers were again compensated $25 for their time. All intervention visits, materials, interviews, and cell phone communications were conducted using either English or Spanish, based on the parent's preference.

Intervention Conditions

Planned Activities Training (PAT). Parents in both the CPAT and PAT intervention conditions participated in PAT during home visits. The aim of PAT is to increase positive interactions between parents and children by teaching parents skills they can use to structure and engage children in activities, and increase their responsiveness to their child. In PAT, the parent learns to plan stimulating play and daily living activities, prepare the child for these activities, and engage the child in activities using effective positive interaction skills and incidental teaching. Through discussion, modeling and practice with constructive feedback, parents were taught to use 10 PAT behaviors with a focus on their use in one particular activity or situation per session. Parents complete a Daily Activities Checklist (Lutzker & Bigelow, 2002) that allows them to select two to three routines daily routines or activities that will be the target areas of the parent training intervention in addition to a play activity.

Parents were introduced to PAT and provided with a PAT parent manual which outlined the steps of PAT, and a set of low-cost, fun activities they could do with their child which would provide opportunities to practice the PAT behaviors. Family coaches first described each of the 10 PAT behaviors in the context of play. During this discussion, the coach and parent discussed parents' specific concerns or goals related to play time, and individualized a PAT checklist to the play activity that would be practiced later in the session. For example, for one PAT behavior, "Explaining the rules," the coach and the parent might discuss ways to talk with the child about simple, easy-to-follow rules that the parent selected for that play activity.

The family coach then modeled the use of PAT with the child in that activity. Parents were then asked to practice PAT in the same activity, and coaching was provided as needed to

support the parent in implementing each PAT behavior. Following the activity, the parent and coach discussed the parent's use of PAT behaviors. The coach provided positive and corrective feedback, and additional practice took place as needed in order to reach the 80% (8 of 10 PAT behaviors used) mastery criterion.

In sessions two, three, and four, PAT was taught in a similar manner (discussion, modeling, practice, and feedback) within two or three different parent-selected daily routines to help parents learn to generalize the strategies. One or two additional sessions were conducted if parents needed additional practice to meet mastery criterion on three activities. In all sessions, except for session one, family coaches observed parents' use of PAT in the activity addressed during the previous session, and parent performance was rated by the family coach. Scores from these observations were used to determine when parents met the mastery criterion of 80% of PAT behaviors used for a total of three activities. In the final session, parents were provided with additional practice, progress was reviewed, and additional planning and problem solving steps were conducted for applying PAT to future situations or other settings.

Cell-Phone Enhanced PAT (CPAT). PAT enhanced through the use of cellular phones involved teaching PAT as described above. In addition to the in-home intervention, parents in the CPAT condition were provided with a cell phone and service to use throughout the intervention phase. There were two components of the cellular phone enhancement that promoted more frequent contact between the Family Coaches and the mothers: (1) phone calls between home visits and (2) twice-daily text messages. A check-in phone call was conducted each week between home visits with questions to inquire about PAT use, parent and child activities, child behavior, and to guide future intervention. Parents could contact coaches with their cell phone, with expected response times from the coach within 24 hours or by the end of the next business day. Parents were able to use the cell phone for personal use as well.

Family coaches sent text messages to the families twice per day, five days per week. Text message content was individualized for each mother, and related to the current focus of the intervention taking place during the home visit during that week. The majority of the text messages consisted of prompts to use PAT strategies and questions about how the strategies worked for them. Some of the 10 text messages sent each week provided suggestions for low-cost or free activities or resources within the community, and supportive messages to the mother that did not directly pertain to the intervention (e.g., providing resources or praising mothers' efforts). In addition, text messages were sent to remind mothers of their next appointment time, or to ask parents for confirmation that parents would be present for visits. Parents were encouraged, but not required to respond to text messages. Family coaches responded promptly when parents responded to these text messages, or initiated text message exchanges with their family coach. All text messages were coded for their content so that the fidelity of the planned type and timing of the messages could be assessed.

Family coaches and their training. Family Coaches conducted the PAT and CPAT sessions; all had a college degree in Early Childhood Education, Social Work or other related field and several years of experience carrying out home visits with urban low-income families. Coaches were trained by one of the developers of PAT, a co-author of the PAT manual (Lutzker & Bigelow, 2002). After training and practice sessions, coaches videotaped themselves demonstrating PAT with a mother and child not participating in the study. Coaches were required to complete 85% of fidelity checklist steps correctly to be certified to conduct PAT.

Fidelity of the intervention was measured throughout the course of the study with supervisory visits conducted with 50% of participant families.

Measures

Parent intervention engagement. Parent engagement was assessed by the family coach using the Parent Engagement Rating Scale (PERS; Baggett, 2003), which was developed for use in a multi-site efficacy trial of a parent responsiveness intervention (Borkowski et al., 2003-2010). Six aspects of parent's engagement in the intervention session were rated on a 3-point scale immediately following each intervention session. Two items were related to information learned at the previous intervention session and were not applicable at the first session (evidence that the parent completed activities assigned at the previous home visit and mastery of PAT behaviors introduced in a previous visit). In order to observe a consistent measure of engagement across each intervention session, only four items were used in the current study: (1) parent participation in the intervention session, (2) parent engagement in practice of new skills during the home visit, (3) mastery of PAT behaviors during the current visit, and (4) ease in engaging the mother in the session. An engagement score was calculated by summing the ratings on these four items to create a parent engagement score for each PAT intervention session (range of 0 to 12), with higher scores indicating higher levels of engagement. Internal consistency reliability coefficients ranged from .65 (on visit 3) to .78 (on visit 1).

Predictors of intervention engagement and completion. Several measures collected at the pre-test assessment were used to predict intervention engagement or completion.

Socio-demographic risk. In order to examine the relationship between risk and engagement, select maternal variables were used to create a risk index. Variables included in the risk index were selected based on factors indicated to be moderators of parenting intervention effectiveness in previous studies (e.g., Ayoub, Vallotton, & Mastergeorge, 2011). Family socio-demographic risk characteristics were assessed at pre-test using items from the Family and Maternal Life History (FMLH) interview and the clinical scores from the Beck Depression Inventory II (BDI-II; Beck, Steer, & Brown, 1996). The FMLH was an 87-item questionnaire with questions pertaining to marital status, family composition and history, education, employment, financial support, health status, drug and alcohol use, services received, and past involvement with child protective services. The BDI-II (Beck et al, 1996) consisted of 21 groups of statements pertaining to depressed mood and somatic complaints. A range of 0 to 3 points were assigned for each group of statements based on the severity of depressed affect that was endorsed. These points were then summed to create a total depression score (ranging from 0 to 63). Reported internal consistency coefficients ranged from .92 to .93. Clinical cut-off categories were used to create a dichotomous variable, with scores of 14 and greater (mild, moderate, and severe depression) indicating mothers were depressed, and scores 13 or lower indicating mothers who were not depressed. Specifically, the risk index was created using the six factors of: 1) mother was not working or in school; 2) mother did not have a high school diploma or GED; 3) mother was unmarried and without a partner; 4) mother received some form of financial assistance; 5) mother was a teenager at the time of her first birth; and 6) mother was depressed (based on the Beck Depression Inventory II clinical cutoffs). These dichotomous factors were summed to create a total risk score with a sample average of 2.66 (SD = 1.19) with a mode of 2

(32% of the mothers had two of the six risks factors described above). The percentages of parents with each risk factor are summarized by group in Table 1. It should be noted that there were no group differences in the presence of any single risk factor or in the mean risk index score.

Planned Activities Training (PAT) Checklist. Prior to intervention, parenting was observed and rated for the appropriate use of 10 PAT behaviors (Lutzker & Bigelow, 2002): Prepare in Advance, Explain the Activity, Explain the Rules, Explain the Consequences, Give Choices, Talk About What You Are Doing, Use Good Interaction Skills, Ignore Minor Misbehavior, Give Feedback, and Provide Rewards/Consequences. The dyads were observed for approximately 20 minutes during a play activity and the clean-up of that activity. Assessors observed each activity and recorded parent use of the PAT behaviors on the 10-item checklist for each of these activities individually. A summary score was created by calculating the percentage of PAT behaviors that were used correctly in that activity (by dividing the number of behaviors completed by the total number of steps possible for each activity). Assessors were trained to meet an 80% agreement criterion with the assessment supervisor at the onset of the study and reliability was monitored every 6 months throughout the course of data collection.

Keys to Interactive Parenting Scale. To assess the quality of interactions between the parent and the target child, the Keys to Interactive Parenting Scale (KIPS; Comfort & Gordon, 2006) was used. Parenting behaviors were rated along 12 dimensions (e.g., response sensitivity, response to emotions, encouragement, limits and consequences, reasonable expectations, supportive directions) during the course of the mother-child interaction described above. Initial studies using the KIPS have been able to maintain inter-rater reliability coefficients ranging from .90 to .96 and the items have a high internal consistency reliability ($\alpha = .89$; Comfort & Gordon, 2006). A total KIPS score was calculated by obtaining a sum of the 5-point rating across each of the 12 items, and then dividing by the total number of items rated.

Child Behavior Rating Scales. To assess child behavior, the Child Behavior Rating Scales (CBRS; Carta, 2006) was used to rate five dimensions of child behavior observed during the 20-minute parent-child interaction. The constructs include engagement with materials, appropriateness of attention seeking, response to caregiver's directions, response to caregiver's initiations, and general affect. Internal consistency for this measure was high at pre-test ($\alpha = .81$). Assessors were trained to meet an 80% agreement criterion with the assessment supervisor at the onset of the study and reliability was monitored every 6 months throughout the course of data collection.

Intervention completion. Intervention completion was defined as having met the mastery criterion of 80% of PAT behaviors used correctly in at least three daily activities addressed during the intervention. These behaviors were observed and assessed by the family coaches as part of the intervention session using the Planned Activities Checklist. Parents were allowed to refer to their PAT materials during the observation.

Parent satisfaction. The PAT Social Validation Questionnaire was used to assess consumer satisfaction on the content and outcome of the intervention, the usefulness of the teaching strategies and the overall acceptability of the performance of the family coach. The CPAT Social Validation Questionnaire also included questions pertaining to satisfaction with the cell phone enhancements. Items were rated by the mothers at the post-test assessment, using a 5-point scale. Items were summed to created two subscales: Satisfaction with PAT and Usefulness of PAT Strategies. Internal consistency of the subscales was very high, $\alpha = .93$ for the 9-item Satisfaction with PAT subscale and $\alpha = .94$ for the 6-item Usefulness of PAT Strategies subscale.

RESULTS

Analysis Plan

The approach to analyzing this data set was aligned with the research aims: first, to describe the intervention engagement data at the onset of the intervention as well as over time; second, to assess whether intervention completion could be predicted by early engagement, intervention condition or socio- demographic risk; and third, to identify pre-test predictors of intervention engagement. Given that there were data missing for the parenting and child variables of interest as well as attrition, IBM SPSS Missing Values software (2011) was used to estimate missing data and to analyze the 40 imputed data sets. The results were summarized using Rubin's rules (Meng & Rubin, 1992; Rubin, 1987). To achieve the first goal, means, standard deviations and frequency distributions were calculated for the engagement measure (PERS) at each visit and analysis of variance was used to test for intervention condition group differences (PAT vs. CPAT) on these variables. Next, logistic regression was used to test whether intervention completion could be predicted by initial engagement, intervention condition, socio-demographic risk or the interaction of risk with engagement. Finally, logistic regression was used again to assess whether early engagement level could be predicted by parenting behavior, child behavior, or socio-demographic risk. Parent satisfaction and perception of the social validity of the intervention were also described.

What Was the Initial Level of Parent Engagement and How Did It Change Over Time?

The analyses for the current project focused on parental engagement on the first intervention visit and its ability to predict intervention completion. Engagement at the first visit had a mean of 11.23 and a standard deviation of 1.23 (range of 5 – 12). The means for the CPAT and PAT groups were not statistically significant, with M = 11.29 (SD = 1.14) for CPAT and M = 11.18 (SD = 1.30) for PAT. The modal score was 12 (highest score possible) for both groups, with 54.3% of the participants receiving this score. At the item level, approximately 90% of the mothers received a score of 3 (the highest rating) on the items pertaining to their participation, practice, and difficulty to engage. For the item pertaining to mastery of PAT behaviors during practice, 56% received a score of 3 (the highest rating) on their first visit after learning about the PAT behaviors and while referring to the intervention materials. At the group level intervention engagement appeared to be stable over time, with ratings available from one to eight visits depending on the intervention length. Means for the engagement ratings at each of the visits ranged from 11.23 to 11.68 (11.29 to 11.68 for CPAT and 11.18 to 11.70 for PAT); standard deviations ranged from .82 to 1.23.

Due to the negative skew of scores on the PERS engagement measure, all further analyses using this measure were completed using natural log transformations or a dichotomous version of the total score (those with a score of 12 (n = 119) compared to those with a score less than 12 (n = 100)). Of parents with an initial score of a 12 (the highest possible score), 78% (n = 93) remained at this high level of engagement throughout the course of the intervention (n = 52 for PAT and n = 41 for CPAT). Of the 100 mothers who were in the lower engaged group, 50 were fully engaged by their last visit and 50 remained at a lower level of engagement. There

were no significant intervention group differences on either of these variables: 56 % of CPAT mothers were engaged at the first visit with 48% of the remaining CPAT mothers becoming fully engaged by their final visit; and 53% of the PAT mothers engaged at the first visit with 52% of the remaining PAT mothers becoming fully engaged by the end of the intervention.

Did Early Engagement, Risk, and Intervention Condition Predict Intervention Completion?

Eighty-three percent of the participants who began the intervention completed the intervention and reached the criterion level of the intervention behaviors on three different activities. During the course of the intervention, participants completed between 1 to 8 visits prior to either completing or dropping out of the intervention. The average number of visits for those who completed the intervention was 4.81 (SD = .74) and 1.63 (SD = 1.20) for those who did not finish the intervention, $t(217) = -21.27$, $p < .001$. The number of visits needed to complete the intervention was not significantly different across intervention groups (M = 4.91, SD = .76 for CPAT and M = 4.73, SD = .72 for PAT). In order to determine whether early engagement in the intervention predicted intervention completion, a logistic regression analysis was conducted. Intervention completion was predicted by the engagement score at the first visit (transformed to account for the negative skew), with a $\chi 2$ (1, N = 219) = 5.02, p = .03 for the model and an unstandardized logistic coefficient of 2.69 and an odds ratio of 14.66, p = .02 for early engagement. The odds of completing the intervention were more than 14 times higher for participants with higher engagement than for those with lower engagement.

Next, the predictors of intervention condition (cell-phone supported or typical PAT), risk index score, and the interaction between risk and engagement were added to the model to predict intervention completion. This model was also significant, $\chi 2$ (4, N = 219) = 3.31, p = .01; intervention condition (in addition to early engagement) was a significant predictor of intervention completion, with an unstandardized logistic coefficient of .90 and an odds ratio of 2.45, p = .03. The odds of completing the intervention were more than twice as high for participants in the cell phone supported condition (11% drop out rate) than for those in the typical PAT intervention (23% drop out rate). The risk index score was not a significant predictor of intervention completion nor was the interaction of risk and engagement.

Was Early Engagement Predicted by Baseline Parenting, Child Behavior and Risk?

To explore what baseline factors might predict initial parent engagement in the intervention, a correlation matrix was completed to observe the relationships among engagement, socio-demographic risk, parenting and child behaviors measured at pre-test (see Table 2). Early engagement had small, but statistically significant correlations with general parenting (KIPS) and child behavior (CBRS) at pre-test. Although the parent's mastery of the use of PAT behaviors was included as an item in the engagement measure, the total score for early engagement was not related to use of PAT behaviors at pre-test (r = -.01 and r = -.04). Socio-demographic risk was negatively related to general parenting (KIPS) at pre-test. Logistic regression analysis was then used to determine whether risk, baseline parenting, and child behaviors predicted maternal engagement level at the first intervention visit. The risk index score, PAT behavior ratings for

both Play and Clean-Up, the general measure of parenting (KIPS), and the Child Behavior Rating Scales (CBRS) total score were used to predict early maternal engagement level. Due to negative skew in the data, log transformations of the PAT Behaviors and the CBRS were entered into the model. The overall model was significant, $\chi 2$ (4, N = 219) = 3.77, p = .005, with PAT behaviors rated during Clean-Up and the KIPS total score as significant predictors. PAT behaviors at Clean-Up had an unstandardized logistic coefficient of -.66 and odds ratio of .52 (p = .05) and the KIPS ratings had a coefficient of .67 and an odds ratio of 1.96 (p = .03). The odds of being in the highly engaged group at the initial intervention visit were almost twice as high for participants with higher parenting ratings than for those with lower parenting ratings. Mothers with fewer PAT behaviors at baseline were more likely to be in the highly engaged group than those mothers with more PAT behaviors. Mothers who were more highly rated on a general measure of parenting (KIPS), but who did not already have the specific skill set taught in the intervention (PAT behaviors) were the most engaged in the intervention.

TABLE2

Correlations among Early Engagement, Socio-demographics, Pre-Test Parenting and Child Behavior (N = 219)

	1	2	3	4	5	6
1. Early Engagement (PERS)	1.00					
2. Socio-demographic Risk	-0.06	1.00				
3. PAT Behaviors - Play	-0.01	-0.10	1.00			
4. PAT Behaviors - Clean - Up	-0.04	-0.07	.68***	1.00		
5. General Parenting (KIPS)	.15*	-0.19**	.43***	.36***	1.00	
6. Behavior (CBRS)	.18**	-0.11	.36***	.30***	.48***	1.00

Note. *p < .05. **p < .01. *** p < .001; PERS Parent Engagement Rating Scale; PAT = Planned Activities Training; KIPS = Keys to Interactive Parenting Scale, CBRS = Child Behavior Rating Scale.

Intervention satisfaction and social validity. In order to examine the mothers' perceptions of the intervention process and the usefulness of the skills taught, means and standard deviations of the subscales of the social validity measure were calculated as well as frequencies of select items from the measure. Intervention condition group differences were assessed using analysis of variance. Satisfaction with the intervention was very high, with an overall mean of 38.48 (SD = 5.54, higher scores indicated higher satisfaction with 45 as the highest score) for the Satisfaction with PAT subscale and an overall mean of 27.78 (SD = 3.88, with 30 as the highest score possible) for the Usefulness of PAT Strategies subscale. There were no significant intervention condition differences with very similar means across groups{ [M = 38.38 (SD = 5.52)] for CPAT vs. [M = 38.58 (SD = 5.58)]} for the PAT mothers' ratings of Satisfaction with PAT and M = 28.02 (SD = 3.70) for CPAT vs. M = 27.54 (SD = 4.07) for the PAT mothers' ratings on the Usefulness of PAT subscale); the cell phone enhancements did not lead to greater satisfaction with the intervention. A large majority of mothers (88%) would recommend the intervention to someone else and 87% reported that they use the strategies taught in the intervention 'a lot' or 'all the time'. In addition, mothers were also asked about the cell phone enhancements: nearly all mothers (98%) enjoyed the frequency of contact with the family

coaches; 96% thought the amount of texting was 'just right'; and 88% thought that the number of phone calls was 'just right'.

DISCUSSION

Based on earlier studies (Nix et al., 2009; Wagner et al., 2003), we predicted that high risk mothers would demonstrate inconsistent patterns of engagement over time and that many would drop out of our home visiting program. We were surprised that the majority of parents in both the CPAT and PAT conditions were either highly engaged during their first home visit or became highly engaged by the last session. An important finding was that a high percentage of mothers (83%) completed all of the required intervention sessions and attained the criterion level of mastery of parenting skills targeted by the intervention.

Similar to Kitzman et al. (1997), we found that mothers who were already fully engaged at the outset of the intervention were most likely to continue their involvement throughout the intervention. It may be that the most highly engaged mothers were those who were most enthusiastic about receiving support for learning new skills to help them meet their parenting challenges. Alternatively, lower engaged mothers either realized during the first visit that the intervention would not meet their needs or would entail more time and energy than they had anticipated. Similar to other studies (Ammerman et al., 2006, Daro et al, 2003), we did not find that mothers with higher levels of risk were more likely to become disengaged or drop out of the intervention.

Rather than high rates of risk leading to lower levels of engagement, our study found mothers with more highly rated parenting behaviors in general, but fewer of the specific skills taught in the interventions, were the most engaged at the intervention visit. Mothers who agree to participate in an intervention to promote positive parenting and who are already using responsive and sensitive parenting behaviors may be more likely to be invested in being a better parent – regardless of their level of demographic and social risks. Invested parents, with a solid set of parenting skills, likely see the intervention as an opportunity to learn a new set of skills and expand their positive parenting repertoires.

The high rates of intervention engagement and completion were also likely due to aspects of the intervention that were not included in the statistical model, such as the experience of the home visitors as well as the socially-valid nature of the intervention. The family coaches that implemented this home-based intervention were all highly experienced, represented the racial and ethnic diversity of the communities from which the sample was drawn, and those who were assigned to Spanish-speaking participants were both bilingual and bi-cultural. The coaches' experience and cultural sensitivity helped to create a welcoming context for the intervention to be introduced.

The intervention itself, Planned Activities Training, involves teaching, modeling, and practicing a concrete set of parenting skills within the natural context of the homes. The focus on specific parenting behaviors and their links to cooperative child behaviors are seen as relevant to the participants early in the intervention. Parents select the activities in which to intervene, adding to the intervention's relevance. At the post-test satisfaction survey, the majority of mothers reported that they would recommend the intervention to other mothers and that they often used the skills learned as part of the intervention, a strong indication of the intervention's social validity. One mother reported, "I think these strategies are awesome. They are simple and

easy and quick that I rarely forget the steps and use them many times a day. Additionally, they are effective just about every time I use them." The finding that mothers who were provided cell phone enhancements were more likely to complete the intervention aligned with our hypothesis that the cellular phone allowed more frequent interactions with family coaches, more timely reminders to practice newly acquired parenting skills, and more frequent opportunities to obtain support for achieving their parenting goals. On a practical level, the phones were also used to maintain contact with mothers throughout the course of the intervention, without being dependent on finding mothers at home or maintaining a consistent address or phone service (Lanzi, et al, 2007), thus making it easier for the family coaches to schedule the home visits and to contact parents when necessary. Cell phones also allowed parents to interact with their coaches and have repeated exposure to intervention content at times of the day that were most convenient (Bigelow, Carta, & Lefever, 2008). For example, one parent reported reading and responding to text messages from her coach during the bus ride home from work. Access to a source of parenting support, with the added mobility to follow the at-risk mothers through all of their parenting contexts, is likely to change the level of investment a mother feels towards the parenting program. It also increases the dosage and magnifies the opportunities to consider the intervention across multiple contexts throughout the day.

Implications for Practice

This study demonstrates that, while mothers that are highly engaged at the outset of the intervention are likely to complete the intervention, the rate of completion could be further improved by offering additional supports. The source of support that we found to be effective in promoting intervention completion was the provision of support via cell phones, especially text messages and convenient phone calls. Cell phones are now ubiquitous, even among low-income families, and text messaging is fairly inexpensive. While cell phones and service were provided at no cost to parents in our study, a February 2012 survey indicated that 88% of American adults own a cell phone; that both African Americans and English-speaking Latinos are as likely as whites to own a mobile phone; and that they are more likely to use their phones for a wider range of activities (Pew Research Center, 2012).

In the study described here, text messages were sent to parents twice per day. In our post-intervention satisfaction survey, most parents who received CPAT reported that two messages per day was "just right," rated highly the use of these cell phone enhancements, and valued the added contact they provided. Further, a number of parents inquired about whether they could continue receiving text messages following the completion of the intervention.

Text messages, by nature, are brief and easy to send. Introducing text messaging with parents within a home visitor's caseload, or even a smaller subset of parents needing additional supports, does not place much additional burden to home visitors' time and resources. With a very small investment in text messaging software, home visitors could use their computer to create a text messaging plan aimed at providing intervention supports and reminders to promote a variety of positive behaviors as well as a way to increase communication and contact with parents on a more consistent basis. Text messaging software can be used to schedule text messages in advance, such as on a home visitor's day off, or on nights or weekends, and can also be used to send a general text message to a group of individuals. The content of text messages can be tailored to fit within the focus of most home visitation programs, and the frequency and

timing of text messages can be individualized to fit within existing programs and parent preferences.

Text messaging is a promising strategy for increasing contact with a hard-to-reach, highly mobile population as well as providing parents with additional support and encouragement aimed at improving parenting practices. Further, providing additional exposure to the content of the intervention throughout the week, in "real time", helps to promote the maintenance and generalization of parenting strategies to novel situations. Identifying parents who are potentially less engaged at the outset of an intervention, and implementing strategies aimed at engaging these parents within the first session or two, can have a significant impact on their long-term engagement and eventual completion of a home visiting program.

Limitations and Conclusions

Although differences in patterns of engagement over time were identified, a major reason for not finding greater differences across risk levels and intervention conditions is that the measure of parent engagement may not have been sensitive enough to detect mothers who were not actively involved in the intervention. Since baseline engagement scores were quite high, there may have been a ceiling effect in place, with our measure unable to detect subtle changes in engagement over time. It should be noted, the measure we used clearly captured the dimensions of engagement that seem necessary for obtaining optimal benefits from our parenting intervention that required mothers to participate actively during each session, to practice skills, and to demonstrate specific parenting behaviors to their family coaches.

While our study was successful in identifying early indicators of disengagement and drop-out for this intervention that focused on parents of preschool-aged children, we realize that a different set of predictors might operate in home visiting programs targeting parents of infants and toddlers. Parents of newborns and inexperienced parents face a unique set of challenges and may be motivated to engage and continue in home visiting programs. Many home visiting programs are longer in duration than the intervention used here, which was generally completed in 5 to 7 sessions. It is unclear how cell phones would affect engagement on a more long-term basis, such as with families enrolled in Head Start and Early Head Start home visiting programs. But what seems clear from our findings is that during the initial intervention session, all home visiting programs should be on alert to early indicators of engagement at the time of the participant's enrollment. Most importantly, cellular phones can be an inexpensive and effective way to maintain contact, provide reminders and encouragement, and sustain the engagement of families from the beginning to the completion of parenting interventions.

REFERENCES

Ammerman, R. T., Stevens, J., Putnam, F. W., Altaye, M., Hulsmann, J. E., Lehmkuhl, H. D., Monroe, J. C., Gannon, T. A., & Van Ginkel, J. B. (2006). Predictors of early engagement in home visitation. *Journal of Family Violence, 21*, 105-115.

Armstrong, K. L., Fraser, J A., Dadds, M. R., & Morris, J. (1999). A randomized, controlled trial of nurse home visiting to vulnerable families with newborns. *Journal of Pediatrics and Child's Health, 35*, 237-244.

Astuto, J. & Allen, L. (2009). Home visitation and young children: An approach worth investing in *SRCD Social Policy Report, 23*, 4, 1-22.

Ayoub, C., Valotton, C. D., & Mastergeorge, A. M. (2011). Developmental pathways to integrated social skills: The roles of parenting and early intervention. *Child Development, 82*, 583-600.

Baggett, K. (2003). *Parent Engagement Rating Scale*. Juniper Gardens Children's Project, University of Kansas. Kansas City: KS.

Baker, A. J., Piotrkowski, C. S., & Brooks-Gunn, J. (1999). The Home Instruction Program for Preschool Youngsters (HIPPY). *The Future of Children, 9*(1), 116-133.

Beck, A.T., Steer, R.A., & Brown, G.K. (1996). *Manual for the Beck Depression Inventory-II.* San Antonio, TX: Psychological Corporation.

Berlin, L.J., O'Neal, C.R., & Brooks-Gunn, J. (1998). What makes early intervention programs work? The program, its participants, or their interaction. *Zero to Three, 18*, 4-15.

Bidgood, B., & van de Sande, A. (1990). In home services to abusive and neglected families. In M. Rothery & G. Cameron (Eds.) *Child maltreatment: Expanded conceptions of helping.* Hillsdale, NJ: Lawrence Erlbaum.

Bigelow, K. M., Carta, J. J., & Burke-Lefever, J. (2008). Txt u ltr: Using cellular phone technology to enhance a parenting intervention for families at risk for neglect.

Borkowski, J., Warren, S., Carta, J., Keltner, B., Ramey, C., Ramey, S., & Landry, S. *Preventing child neglect in high-risk mothers.* Funded by the National Institute on Child Health and Human Development, U.S. Department of Health and Human Services, 2003-2010.

Carta, J. (2006). *Child Behavior Rating Scale*. Juniper Gardens Children's Project, University of Kansas. Kansas City: KS.

Carta, J., Lefever, J., Bigelow, K, Borkowski, J., & Warren, S. (2011). Preventing Child Maltreatment through a Cellular-Phone Technology-Based Parenting Program. Final report for the Centers for Disease Control and Prevention. Atlanta, GA.

Coatsworth, J. D., Santisteban, D. A., McBride, C. K., & Szapocznik, J. (2001). Brief strategic family therapy versus community control: Engagement, retention, and an exploration of the moderating role of adolescent symptom severity. *Family Process, 40*, 313–331.

Comfort, M., & Gordon, P. R. (2006). The Keys to Interactive Parenting Scale (KIPS): A practical observational assessment of parenting behavior. *NHSA Dialog, 10*, 22-4.

Cunningham, C. E., Bremner, R., & Boyle, M. (1995). Large group community-based parenting for families of preschoolers at risk for disruptive behaviour disorders: Utilization, cost effectiveness, and outcome. *Journal of Child Psychology and Psychiatry, 36*, 1141–1159.

Cunningham, P. B., & Henggeler, S. W. (1999). Engaging multiproblem families in treatment: Lessons learned throughout the development of multisystemic therapy. *Family Process, 38*, 265–286.

Daro, D. A., & Harding, K. A. (1999). Healthy Families America: Using research to enhance practice. *The Future of Children, 9* (1), 152–176.

Dishion, T. J., & Kavanagh, K. (2000). A multi-level approach to family-centered prevention in schools: Process and outcome. *Addictive Behaviors, 2*5, 899-911.

Duggan, A. K., McFarlane, E. C., Windham,A. M., Rohde, C. A., Salkever, D. S., Fuddy, L., et al. (1999). Evaluation of Hawaii's Healthy Start Program. *Future of Children, 9*(1), 66-90.

Fontana, C. A., Fleischman, A. R., McCarton, C., Metzler, A., & Ruff, C. (1989). A neonatal preventive study: Issues of recruitment and retention. *Journal of Primary Prevention, 9*, 164-176.

Girvin, H., DePanfilis, D., & Daining, C. (2007). Predicting program completion among families enrolled in a child neglect preventive intervention. *Research on Social Work Practice, 17*, 674-685.

Gomby, D. S. (2005). Promise and limitations of home visitation. *Journal of the American Medical Association, 284*, 1430–1431.

Gomby, D. S. *Home Visitation in 2005: Outcomes for Children and Parents*, Working Paper No 7, Invest in Kids Working Group, July 2005.

Gomby, D. S., Culross, P. L., & Behrman, R. E. (1999). Home visiting: Recent program evaluations-analysis and recommendations. *The Future of Children, 9*(1), 4–26.

Gorman-Smith, D., Tolan, P. H.,, Henry, D. B., Leventhal, A., Schoeny, M., & Lutovsky, K. (2002). Predictors of participation in a family-focused preventive intervention for substance use. *Psychology of Addictive Behavior, 16*, S55-S64.

Heinrichs, N., Bertram, H., Kuschel, A., & Hahlweg, K. (2005). Parent recruitment and retention in a universal prevention program for child behavior and emotional problems: Barriers to research and program participation. *Prevention Science, 6*, 275–286.

Herzog, E. P., Cherniss, D. S. and Menzel, B. J. (1986), Issues in engaging high-risk adolescent mothers in supportive work. *Infant Ment. Health J., 7:* 59–68. doi: 10.1002/1097-0355(198621)7:1<59::AID-IMHJ2280070107>3.0.CO;2-P

Kazdin, A. E., Holland, L., & Crowley, M. (1997). Family experience of barriers to treatment and premature termination from child therapy. *Journal of Consulting and Clinical Psychology, 65,* 433–463.

Kitzman, H. J., Cole, R., Yoos, H. L., & Olds, D. (1997). Challenges experienced by home visitors: A qualitative study of program implementation. *Journal of Community Psychology, 25*, 95-109.

Korfmacher, J., Green, B., Staerkel, F., Peterson, C., Cook, G., Roggman, L., Faldowski, R. A., & Schiffman, R. (2008) Parent involvement in early childhood home visiting. *Child Youth Care Forum, 37*, 171–196.

Lanzi, R. G., Ramey, S. L., Lefever, J. B., Guest, K. C., Atwater, J., Hughes, K., & the Centers for the Prevention of Child Neglect (2007). Cell phone methodology for research and service with high risk populations. *National Head Start Association Dialog, 10* (1), 58-66.

Layzer, J. I., Goodson, B. D., Bernstein, L., & Price, C. (2001). National evaluation of family support programs final report. Vol. A. The meta-analysis. Report submitted to Administration for Children, Youth, and Families. Cambridge, MA: Abt Associates. (ERIC Document Reproduction Service No. ED462186).

Lazev, A. B., Vidrine, D. J., Arduino, R. C., & Gritz, E. R. (2004). Increasing access to smoking cessation treatment in a low-income, HIV-positive population: The feasibility of using cellular telephones. *Nicotine & Tobacco Research, 6*, 281-286.

Liddle, H. A. (1995). Conceptual and clinical dimensions of a multidimensional, multisystems engagement strategy in family-based adolescent treatment. *Psychotherapy, 32*, 39–58.

Littell, J. H., Alexander, L. B., & Reynolds, W. W. (2001). Client participation: Central and underinvestigated elements of intervention. *Social Services Review, 75*, 1–28.

Lutzker, J. R., & Bigelow, K. M. (2002). *Reducing child maltreatment: A guidebook for parent services*. New York: Guilford Press.

McCurdy, K., & Daro, D. (2001). Parent involvement in family support programs: An integrated theory. *Family Relations, 50*(2), 113–121.

Meng, X., & Rubin, D. B. (1992). Performing likelihood ratio tests with multiply-imputed data sets. *Biometrika, 79*(1), 103-111, doi:10.1093/biomet/79.1.103

Miller, W. R., & Rollnick, S.R., (2002). *Motivational interviewing: Preparing people for change*: New York: Guilford Press.

Navaie-Waliser, M., Martin, S.L., Campbell, M.K., Tessarro, I., & Cross, A.W. (2000). Factors predictive of program completion by high-risk pregnant women: The experience of the North Carolina Maternal Outreach Worker Program. *American Journal of Public Health, 90*, 121-124

Nix, R. L., Bierman, K. L., & McMahon, R. J. (2009). How attendance and quality of participation affect treatment response to parent management training. *Journal of Consulting and Clinical Psychology, 77*, 429–438.

Pew Research Center (2012). *Digital Differences*. Retrieved on May 29, 2012, from http://pewinternet.org/Reports/2012/Digital-differences.aspx

Prado, G., Pantin, H., Schwartz, S. J., Lupei, N. S., & Szapocznik, J. (2005). Predictors of engagement and retention into a parent-centered, ecodevelopmental HIV preventive intervention for Hispanic adolescents and their families. *Journal of Pediatric Psychology, 31,* 874-890.

Prinz, R. J., & Miller, G. E. (1991). Issues in understanding and treating childhood conduct problems in disadvantaged populations. *Journal of Clinical Child Psychology, 20*, 379–385.

Roggman, L. A., Boyce, L. K., Cook, G. A., & Cook, J. (2002). Getting dads involved: Predictors of father involvement in Early Head Start and with their children. *Infant Mental Health Journal, 23*, 62–78.

Rubin, D. B. (1987). *Multiple Imputation for Nonresponse in Surveys*. Wiley & Sons: New York.

St. Pierre, R. G., & Layzer, J. I. (1999). Using home visits for multiple purposes: The Comprehensive Child Development Program. The Future of Children, 9, 134-151. Spoth, R., & Redmond, C. (1995). Parent motivation to enroll in parenting skills programs: A model of family context and health belief predictors. *Journal of Family Psychology, 9*,294–310.

Sweet, M., & Appelbaum, M. (2004). Is home visiting an effective strategy? A meta-analytic review of home visiting programs for families with young children. *Child Development, 75*, 1435 – 1456.

Villanueva, A. *Can Cell Phones Message Service Increase Adherence in HIV/AIDS Patients on Therapy?* Retrieved November 28, 2007 from Harvard University, School of Public Health Web site: http://www.hsph.harvard.edu/takemi/RP216.pdf.

Wagner, M, Spiker, D., Linn, M. I., & Hernandez, F. (2003). Dimensions of parental engagement in home visiting programs: Exploratory study. *Topics in Early Childhood Special Education, 23*, 171-187.

Watt, B. D., Hoyland, M., Best, D., & Dadds, M. R. (2007). Treatment participation among children with conduct problems and the role of telephone reminders. *Journal of Child and Family Studies*, *16*, 522–530.

Yatchmenoff, D. K. (2005). Measuring client engagement from the client's perspective in nonvoluntary child protective services. *Research on Social Work Practice*, *15*, 84–96.